FIG. 1

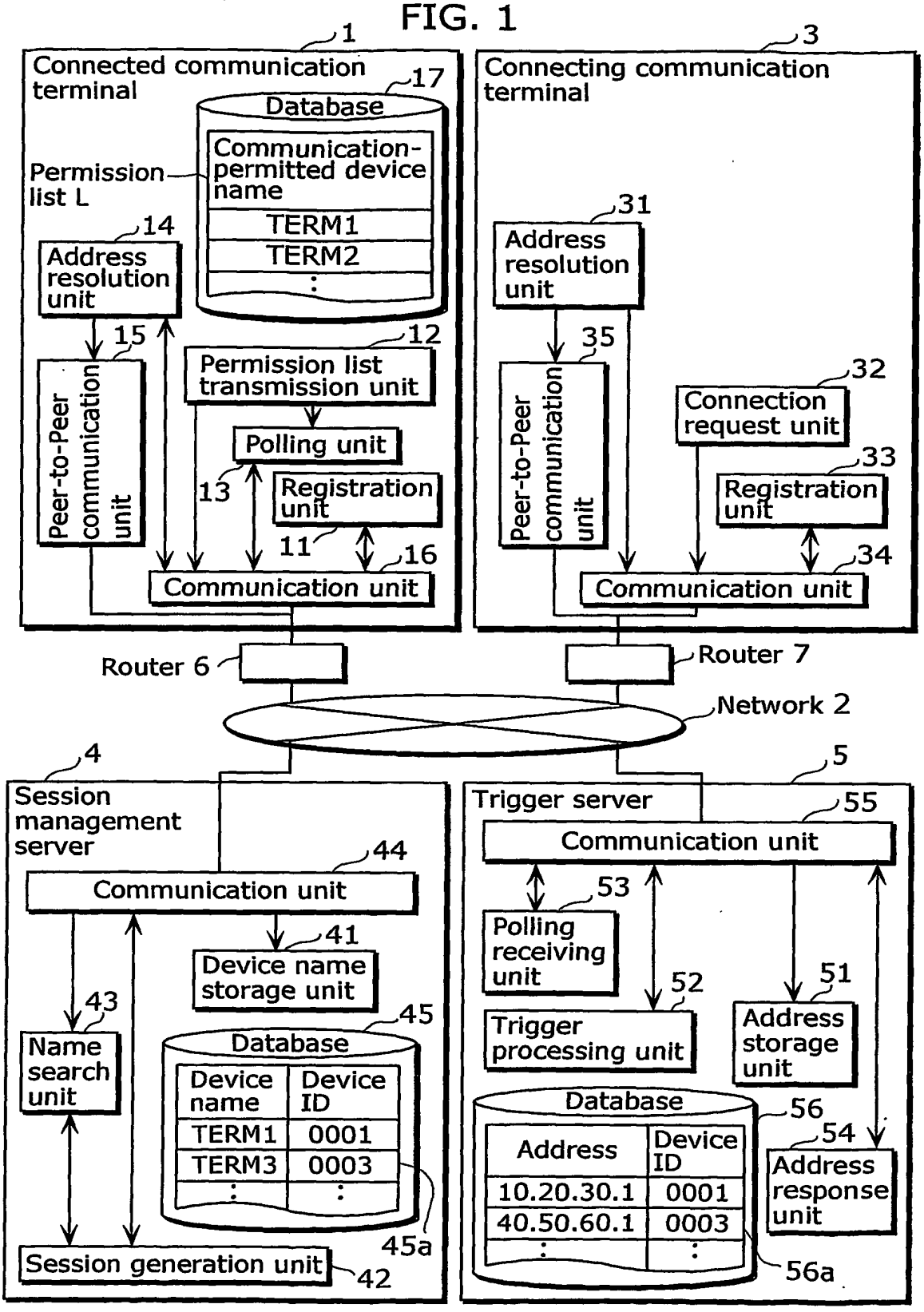

1
Connected communication terminal
17
Database
Communication-permitted device name
TERM1
TERM2
Permission list L
14
Address resolution unit
15
Peer-to-Peer communication unit
12
Permission list transmission unit
Polling unit
13
Registration unit
11
16
Communication unit
3
Connecting communication terminal
31
Address resolution unit
35
Peer-to-Peer communication unit
32
Connection request unit
33
Registration unit
34
Communication unit
Router 6
Router 7
Network 2
4
Session management server
44
Communication unit
41
Device name storage unit
43
Name search unit
45
Database
Device name
Device ID
TERM1
0001
TERM3
0003
45a
Session generation unit
42
5
Trigger server
55
Communication unit
53
Polling receiving unit
52
Trigger processing unit
51
Address storage unit
Database
56
Address
Device ID
10.20.30.1
0001
40.50.60.1
0003
56a
54
Address response unit

FIG. 2

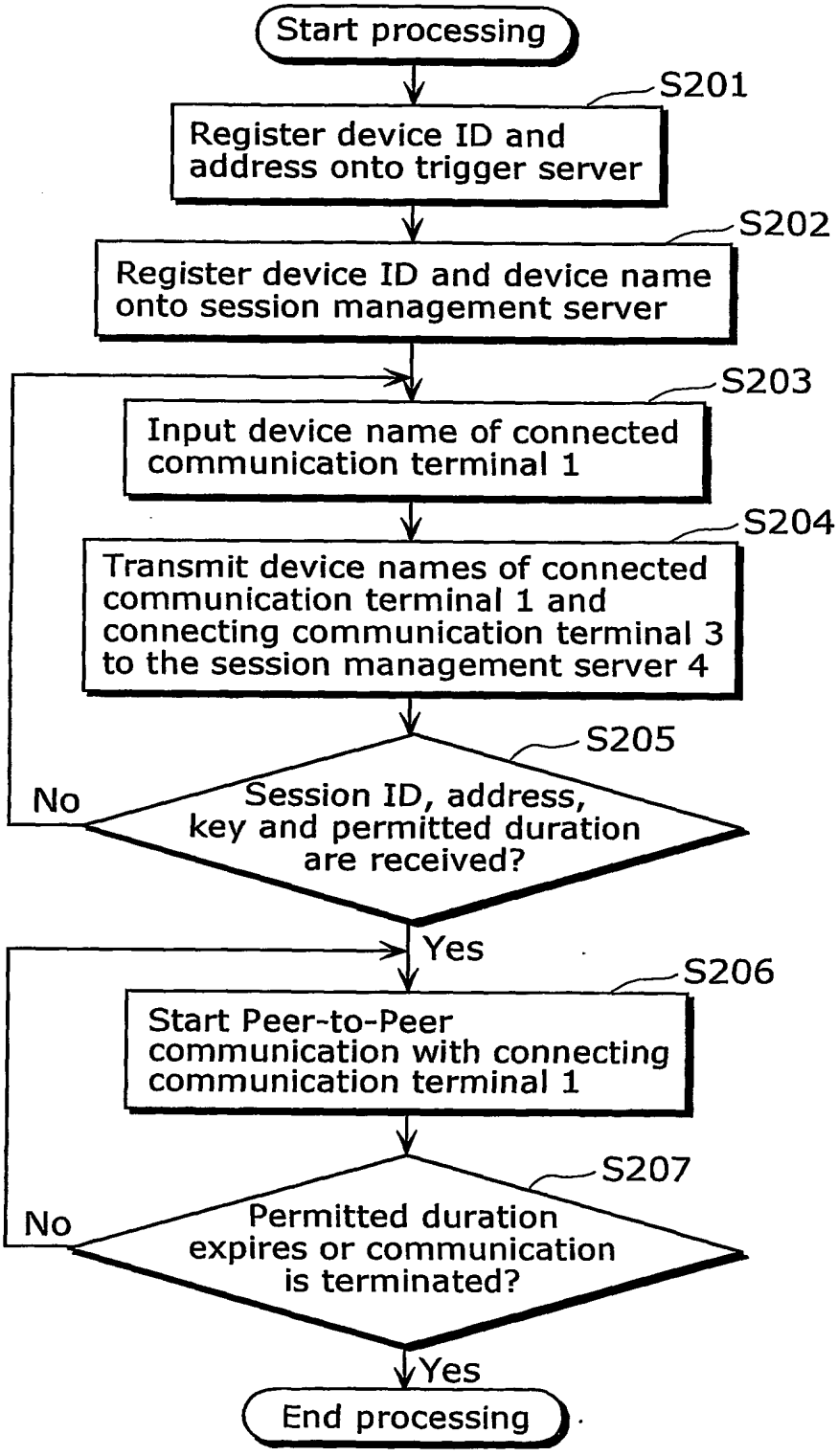

Start processing
S201
Register device ID and address onto trigger server
S202
Register device ID and device name onto session management server
S203
Input device name of connected communication terminal 1
S204
Transmit device names of connected communication terminal 1 and connecting communication terminal 3 to the session management server 4
S205
Session ID, address, key and permitted duration are received?
No
Yes
S206
Start Peer-to-Peer communication with connecting communication terminal 1
S207
Permitted duration expires or communication is terminated?
No
Yes
End processing

FIG. 3

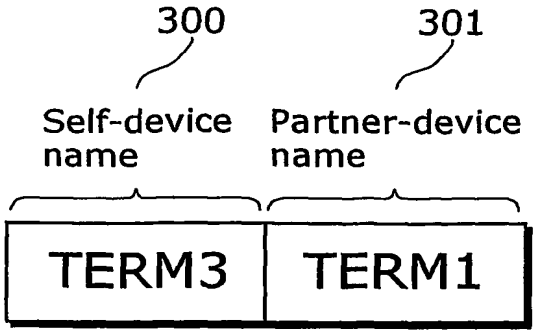


FIG. 4A

400

401 Session ID	402 Address (of connected communication terminal)	403 Key	404 Permitted duration
S0001	10.20.30.1	01de 1a58 596f 58db 5a0e 9543 4812 12ea 3a8c 77ac 85c2 1587 1d9c fc91 de85 0954	60

FIG. 4B

410

411 Session ID	412 Address (of connecting communication terminal)	413 Key	414 Permitted duration
S0001	40.50.60.1	01de 1a58 596f 58db 5a0e 9543 4812 12ea 3a8c 77ac 85c2 1587 1d9c fc91 de85 0954	60

FIG. 5

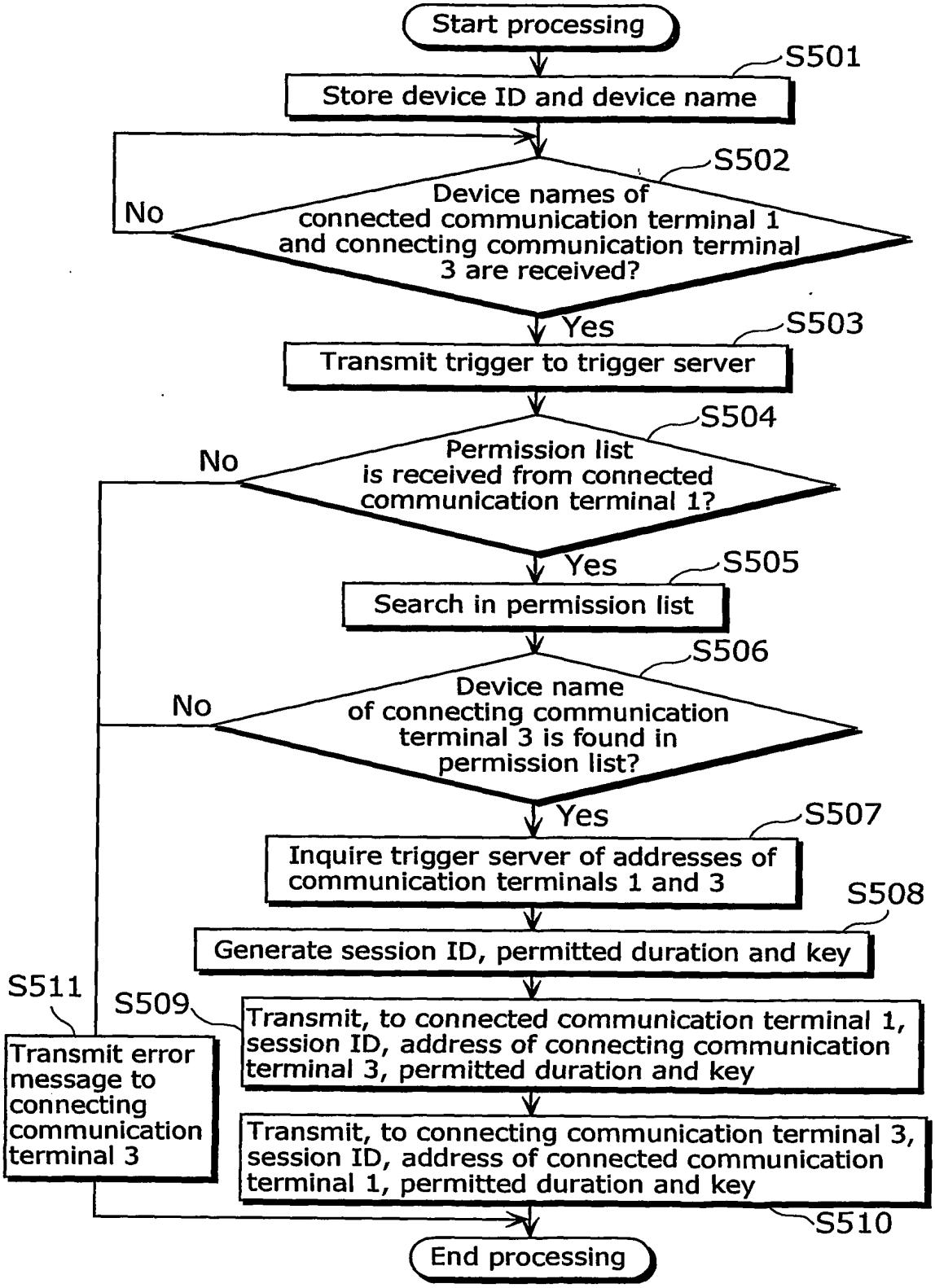

Start processing
S501
Store device ID and device name
S502
Device names of connected communication terminal 1 and connecting communication terminal 3 are received?
No
Yes
S503
Transmit trigger to trigger server
S504
Permission list is received from connected communication terminal 1?
No
Yes
S505
Search in permission list
S506
Device name of connecting communication terminal 3 is found in permission list?
No
Yes
S507
Inquire trigger server of addresses of communication terminals 1 and 3
S508
Generate session ID, permitted duration and key
S509
Transmit, to connected communication terminal 1, session ID, address of connecting communication terminal 3, permitted duration and key
Transmit, to connecting communication terminal 3, session ID, address of connected communication terminal 1, permitted duration and key
S510
S511
Transmit error message to connecting communication terminal 3
End processing

FIG. 6

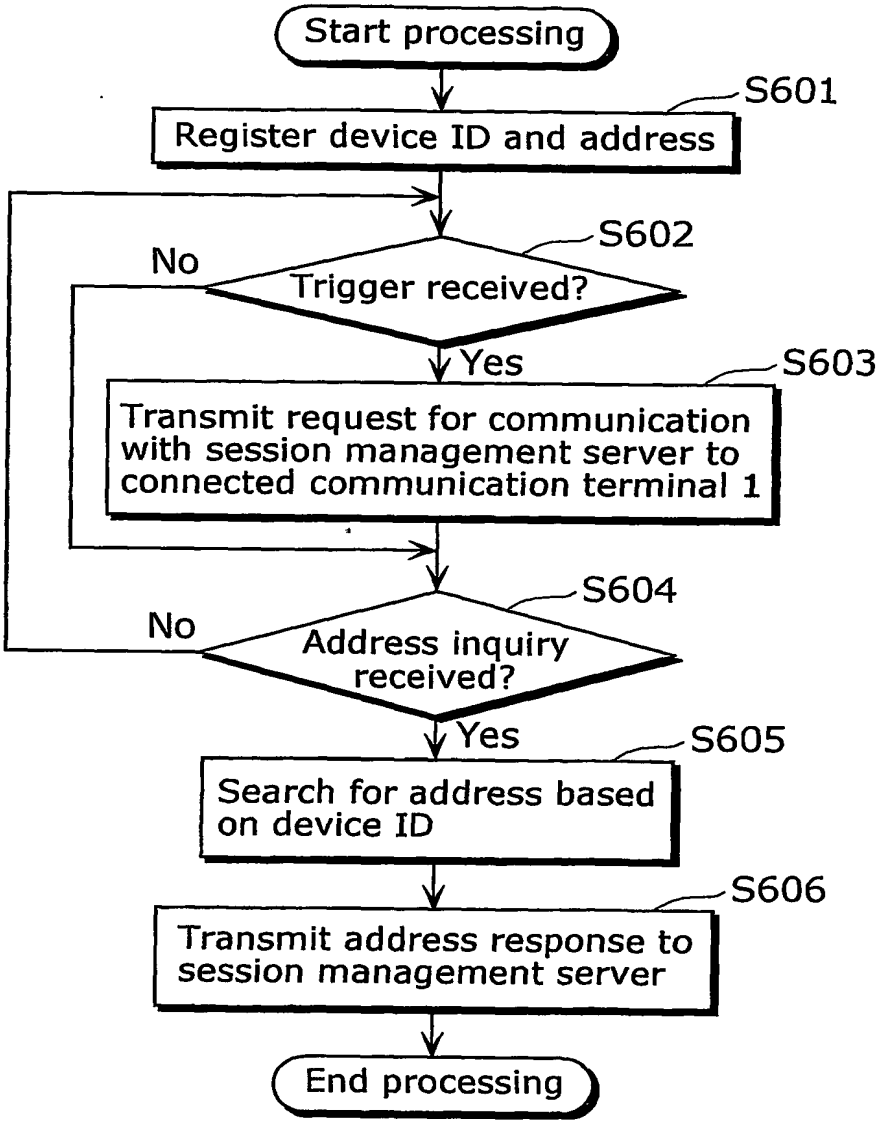

Start processing
S601
Register device ID and address
S602
No
Trigger received?
Yes
S603
Transmit request for communication with session management server to connected communication terminal 1
S604
No
Address inquiry received?
Yes
S605
Search for address based on device ID
S606
Transmit address response to session management server
End processing

FIG. 7

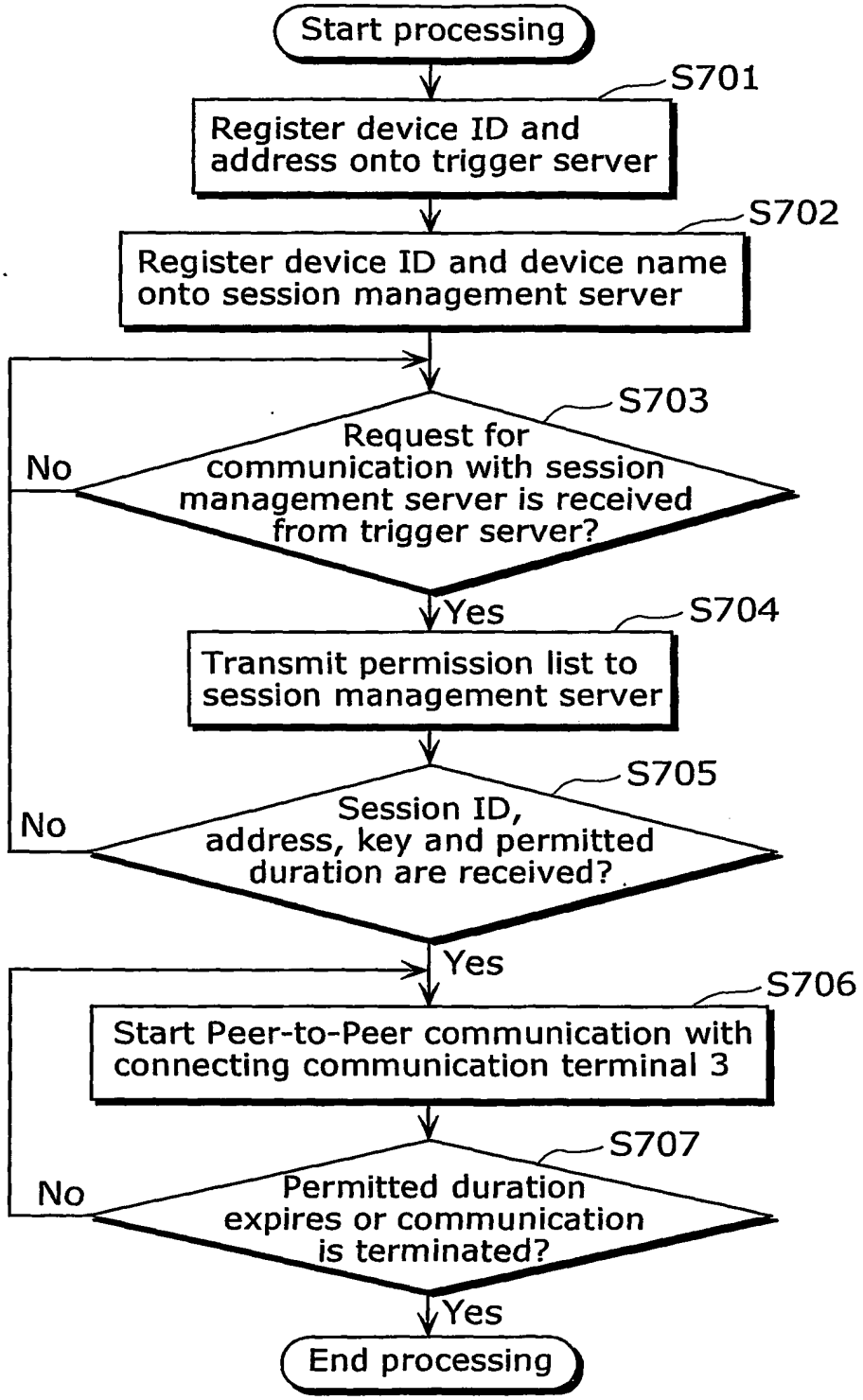

Start processing
S701
Register device ID and address onto trigger server
S702
Register device ID and device name onto session management server
S703
Request for communication with session management server is received from trigger server?
No
Yes
S704
Transmit permission list to session management server
S705
Session ID, address, key and permitted duration are received?
No
Yes
S706
Start Peer-to-Peer communication with connecting communication terminal 3
S707
Permitted duration expires or communication is terminated?
No
Yes
End processing

FIG. 8

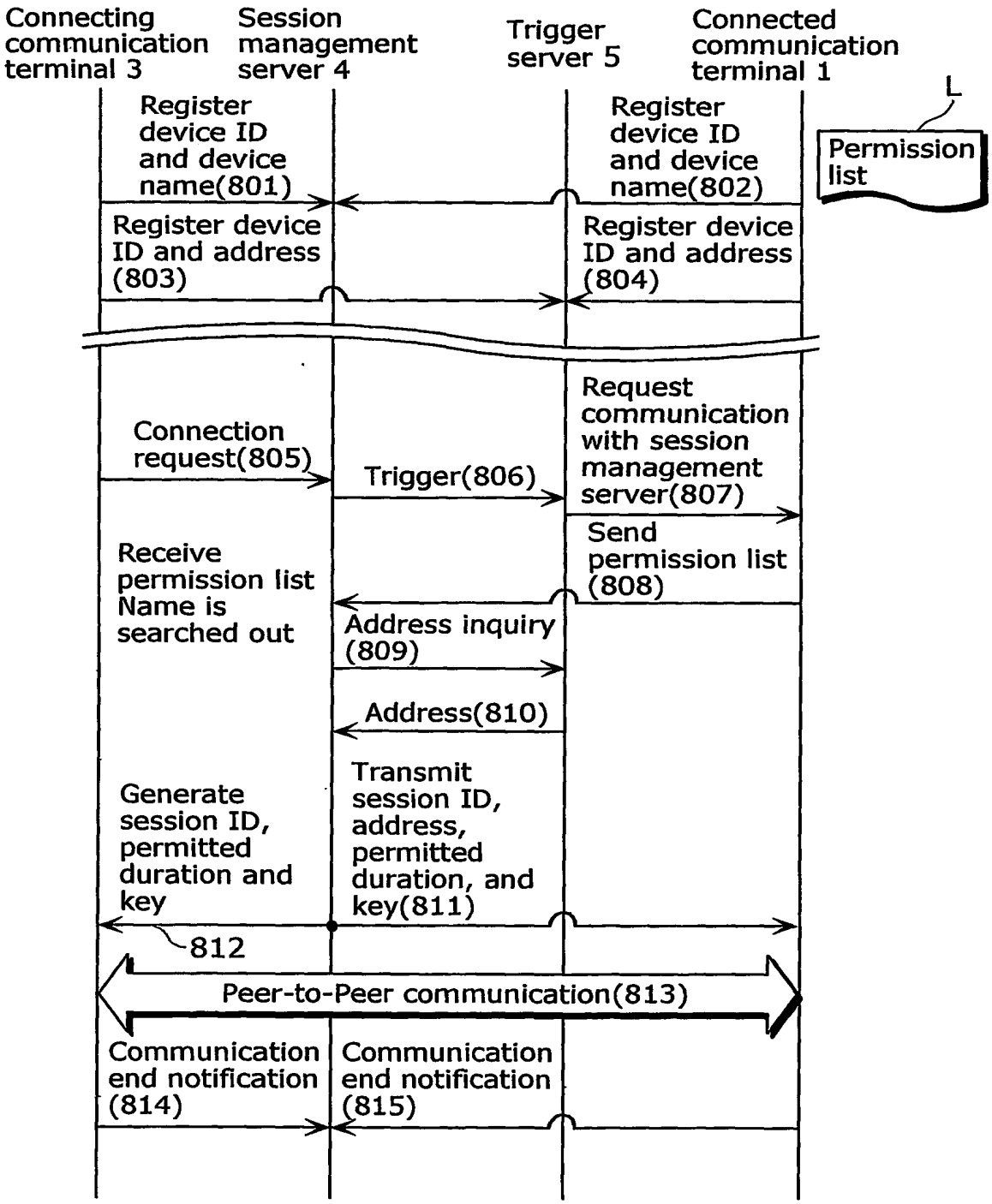

Connecting communication terminal 3
Session management server 4
Trigger server 5
Connected communication terminal 1
L
Permission list
Register device ID and device name(801)
Register device ID and device name(802)
Register device ID and address (803)
Register device ID and address (804)
Connection request(805)
Trigger(806)
Request communication with session management server(807)
Send permission list (808)
Receive permission list Name is searched out
Address inquiry (809)
Address(810)
Transmit session ID, address, permitted duration, and key(811)
Generate session ID, permitted duration and key
812
Peer-to-Peer communication(813)
Communication end notification (814)
Communication end notification (815)

FIG. 9A

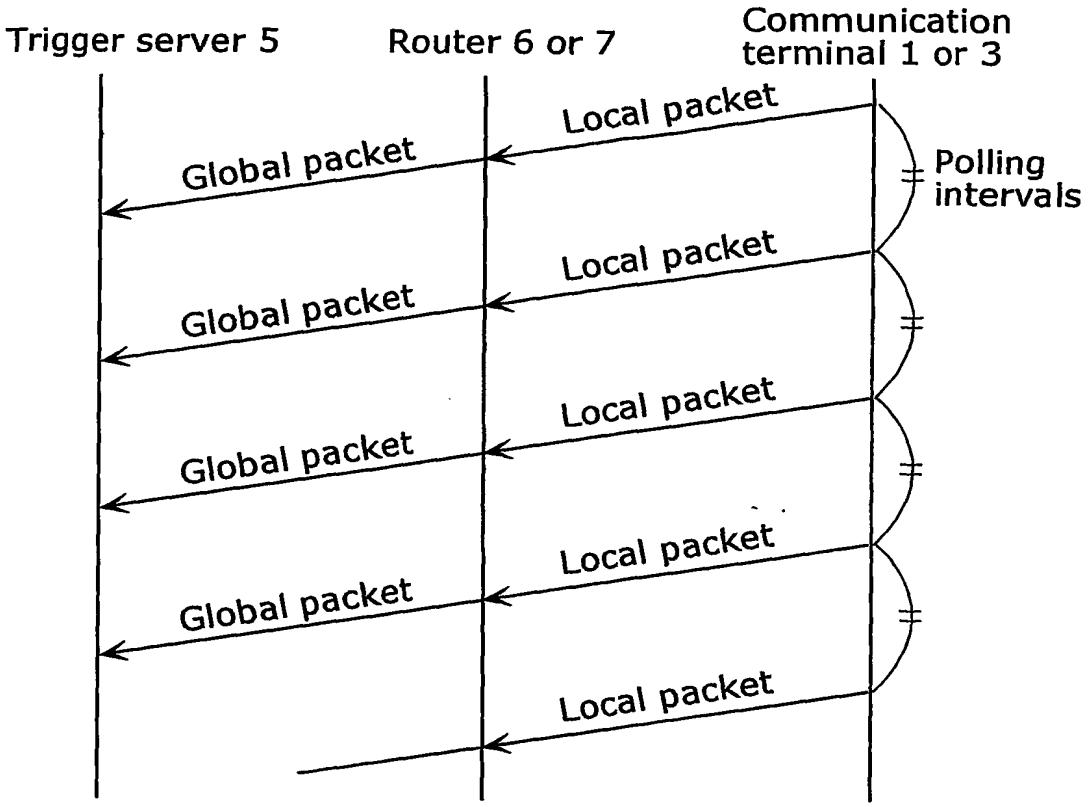


FIG. 9B

901

Header section				Data section		
Destination address	Destination port number	Source address	Source port number	Device ID	Port number	----

FIG. 9C

Router 6 or 7

902

Local network side		Global network side	
Local address	Port number	Global address	Port number
192.168.0.2	5000	200.123.4.5	6000
192.168.0.3	5000	200.123.4.5	6080
:	:	:	:

FIG. 10

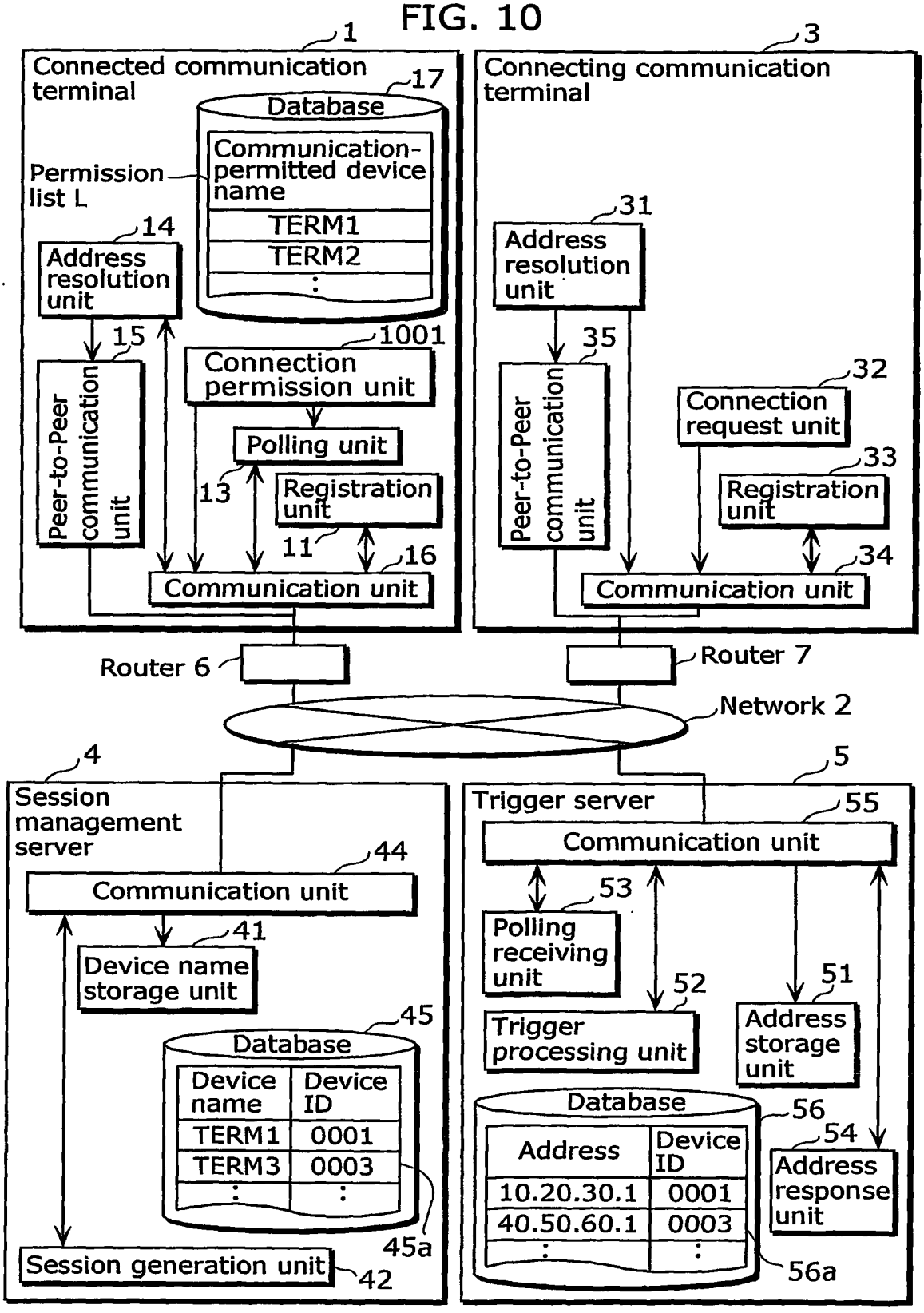

1
Connected communication terminal
17
Database
Communication-permitted device name
Permission list L
TERM1
TERM2
14
Address resolution unit
15
Peer-to-Peer communication unit
1001
Connection permission unit
Polling unit
13
Registration unit
11
16
Communication unit
3
Connecting communication terminal
31
Address resolution unit
35
Peer-to-Peer communication unit
32
Connection request unit
33
Registration unit
34
Communication unit
Router 6
Router 7
Network 2
4
Session management server
44
Communication unit
41
Device name storage unit
45
Database
Device name
Device ID
TERM1
0001
TERM3
0003
45a
Session generation unit
42
5
Trigger server
55
Communication unit
53
Polling receiving unit
52
Trigger processing unit
51
Address storage unit
Database
56
Address
Device ID
10.20.30.1
0001
40.50.60.1
0003
56a
54
Address response unit

FIG. 11

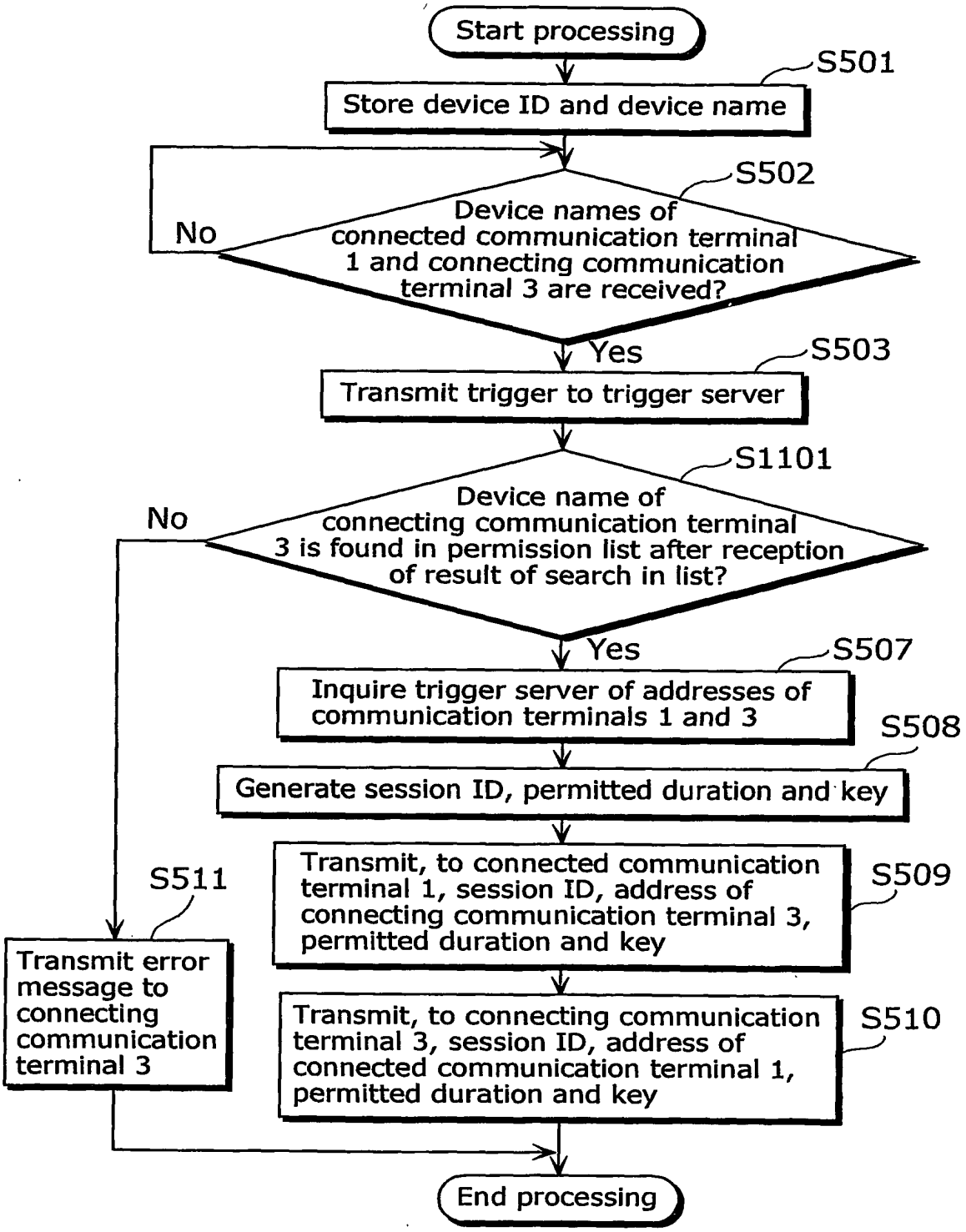

Start processing
S501
Store device ID and device name
S502
Device names of connected communication terminal 1 and connecting communication terminal 3 are received?
No
Yes
S503
Transmit trigger to trigger server
S1101
Device name of connecting communication terminal 3 is found in permission list after reception of result of search in list?
No
Yes
S507
Inquire trigger server of addresses of communication terminals 1 and 3
S508
Generate session ID, permitted duration and key
S509
Transmit, to connected communication terminal 1, session ID, address of connecting communication terminal 3, permitted duration and key
S510
Transmit, to connecting communication terminal 3, session ID, address of connected communication terminal 1, permitted duration and key
S511
Transmit error message to connecting communication terminal 3
End processing

FIG. 12

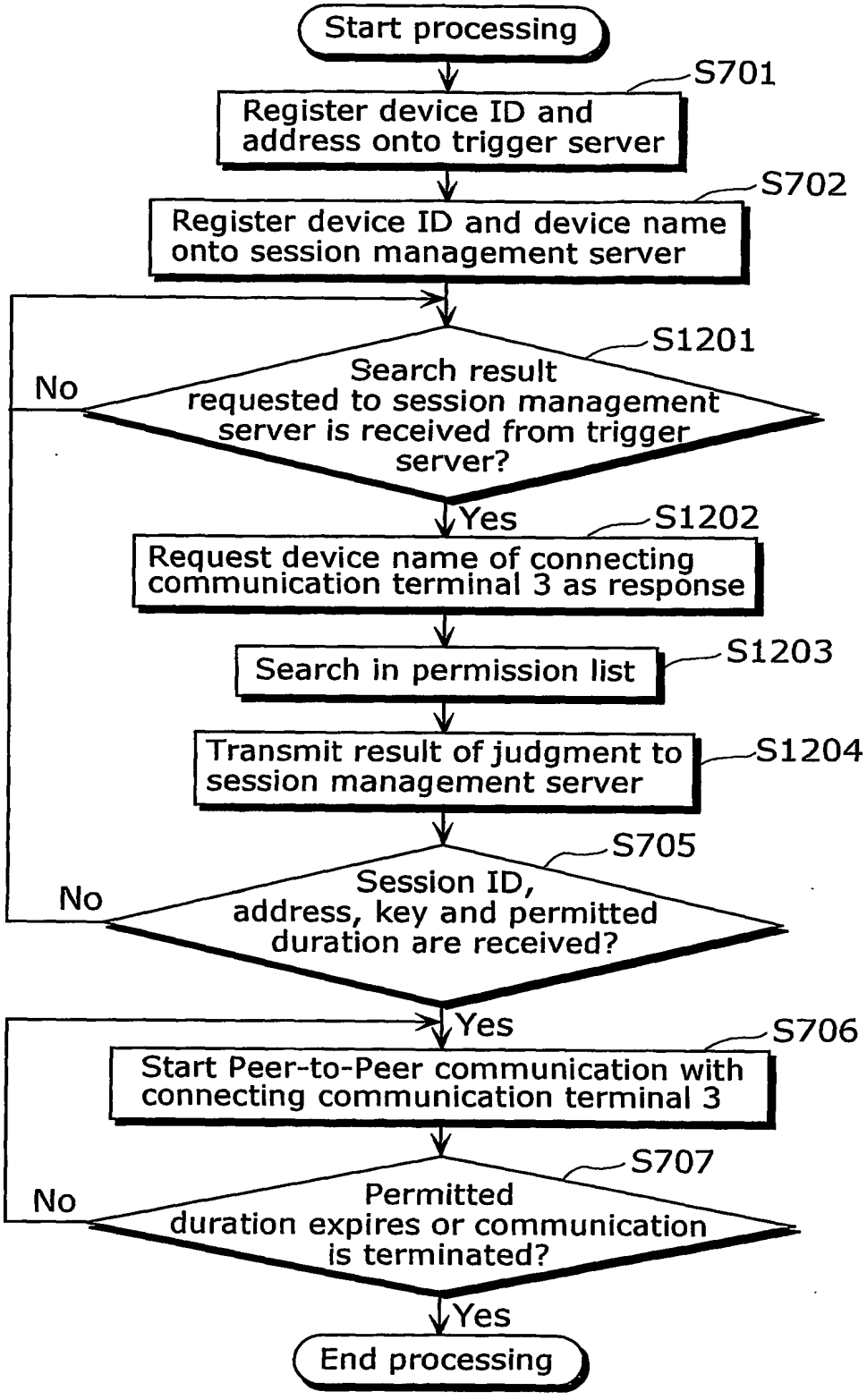

Start processing
S701
Register device ID and address onto trigger server
S702
Register device ID and device name onto session management server
S1201
Search result requested to session management server is received from trigger server?
No
Yes
S1202
Request device name of connecting communication terminal 3 as response
Search in permission list
S1203
Transmit result of judgment to session management server
S1204
S705
Session ID, address, key and permitted duration are received?
No
Yes
S706
Start Peer-to-Peer communication with connecting communication terminal 3
S707
Permitted duration expires or communication is terminated?
No
Yes
End processing

FIG. 13

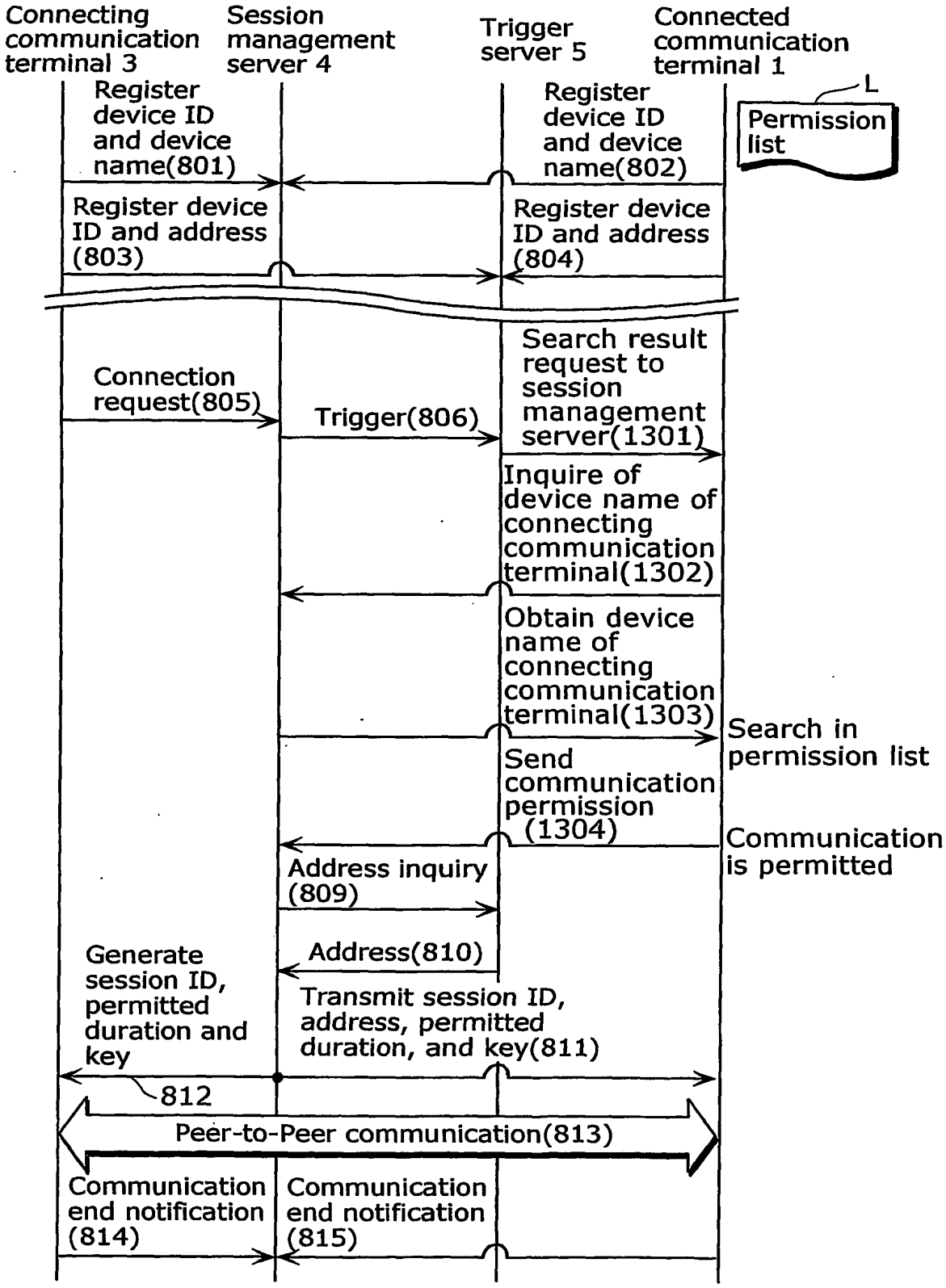

Connecting communication terminal 3
Session management server 4
Trigger server 5
Connected communication terminal 1
Register device ID and device name(801)
Register device ID and device name(802)
L
Permission list
Register device ID and address (803)
Register device ID and address (804)
Search result request to session management server(1301)
Connection request(805)
Trigger(806)
Inquire of device name of connecting communication terminal(1302)
Obtain device name of connecting communication terminal(1303)
Search in permission list
Send communication permission (1304)
Communication is permitted
Address inquiry (809)
Address(810)
Generate session ID, permitted duration and key
Transmit session ID, address, permitted duration, and key(811)
812
Peer-to-Peer communication(813)
Communication end notification (814)
Communication end notification (815)

FIG. 14

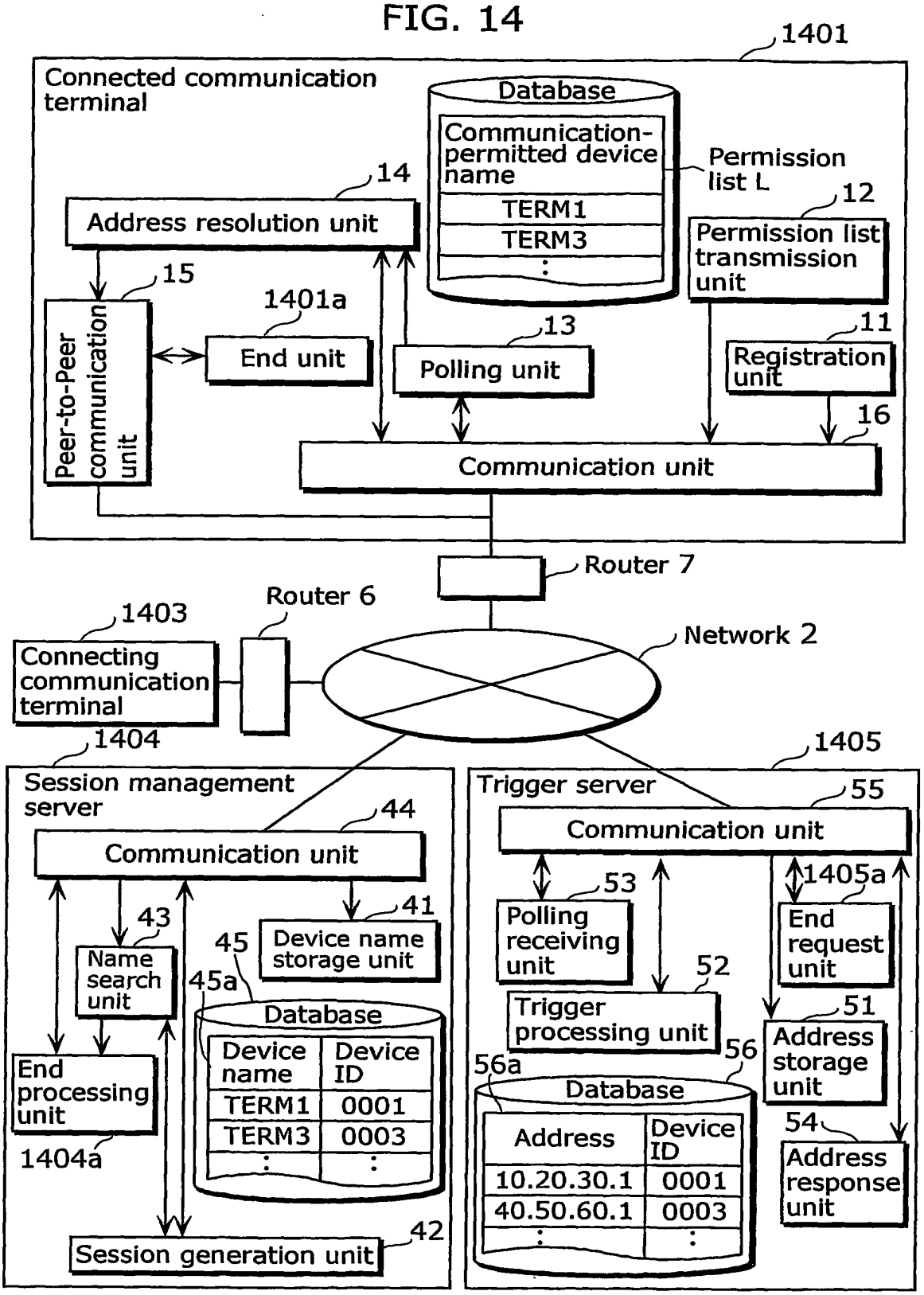

1401
Connected communication terminal
Database
Communication-permitted device name
TERM1
TERM3
Permission list L
14
Address resolution unit
12
Permission list transmission unit
15
1401a
End unit
13
Polling unit
11
Registration unit
Peer-to-Peer communication unit
16
Communication unit
Router 7
Router 6
1403
Connecting communication terminal
Network 2
1404
Session management server
1405
Trigger server
44
Communication unit
55
Communication unit
53
1405a
43
41
45
Device name storage unit
Name search unit
45a
Database
Device name
Device ID
TERM1
0001
TERM3
0003
Polling receiving unit
End request unit
52
Trigger processing unit
51
Address storage unit
56
56a
End processing unit
1404a
Database
Address
Device ID
10.20.30.1
0001
40.50.60.1
0003
54
Address response unit
42
Session generation unit

FIG. 15

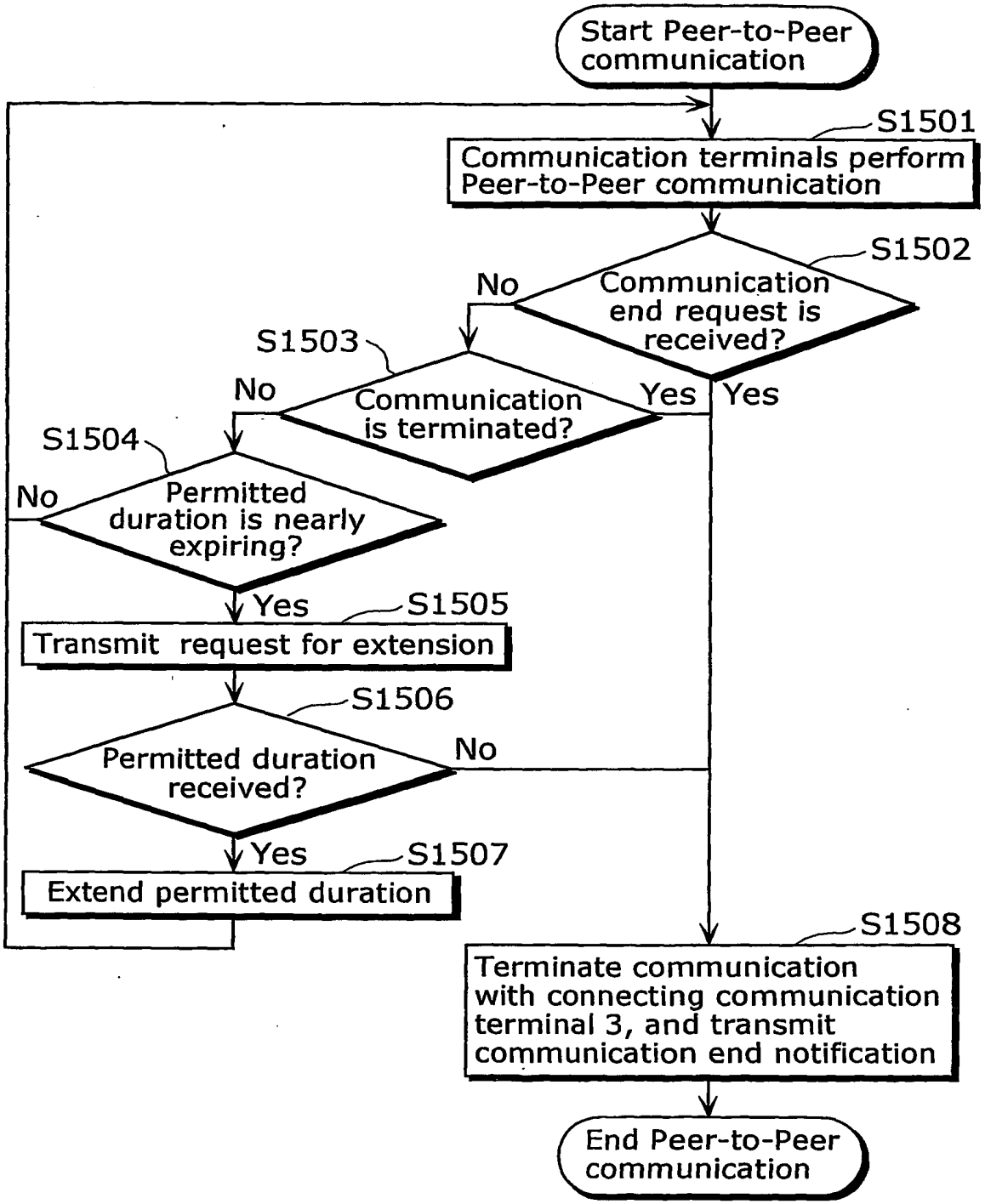

Start Peer-to-Peer communication
S1501
Communication terminals perform Peer-to-Peer communication
S1502
Communication end request is received?
No
Yes
S1503
Communication is terminated?
No
Yes
S1504
Permitted duration is nearly expiring?
No
Yes
S1505
Transmit request for extension
S1506
Permitted duration received?
No
Yes
S1507
Extend permitted duration
S1508
Terminate communication with connecting communication terminal 3, and transmit communication end notification
End Peer-to-Peer communication

FIG. 16

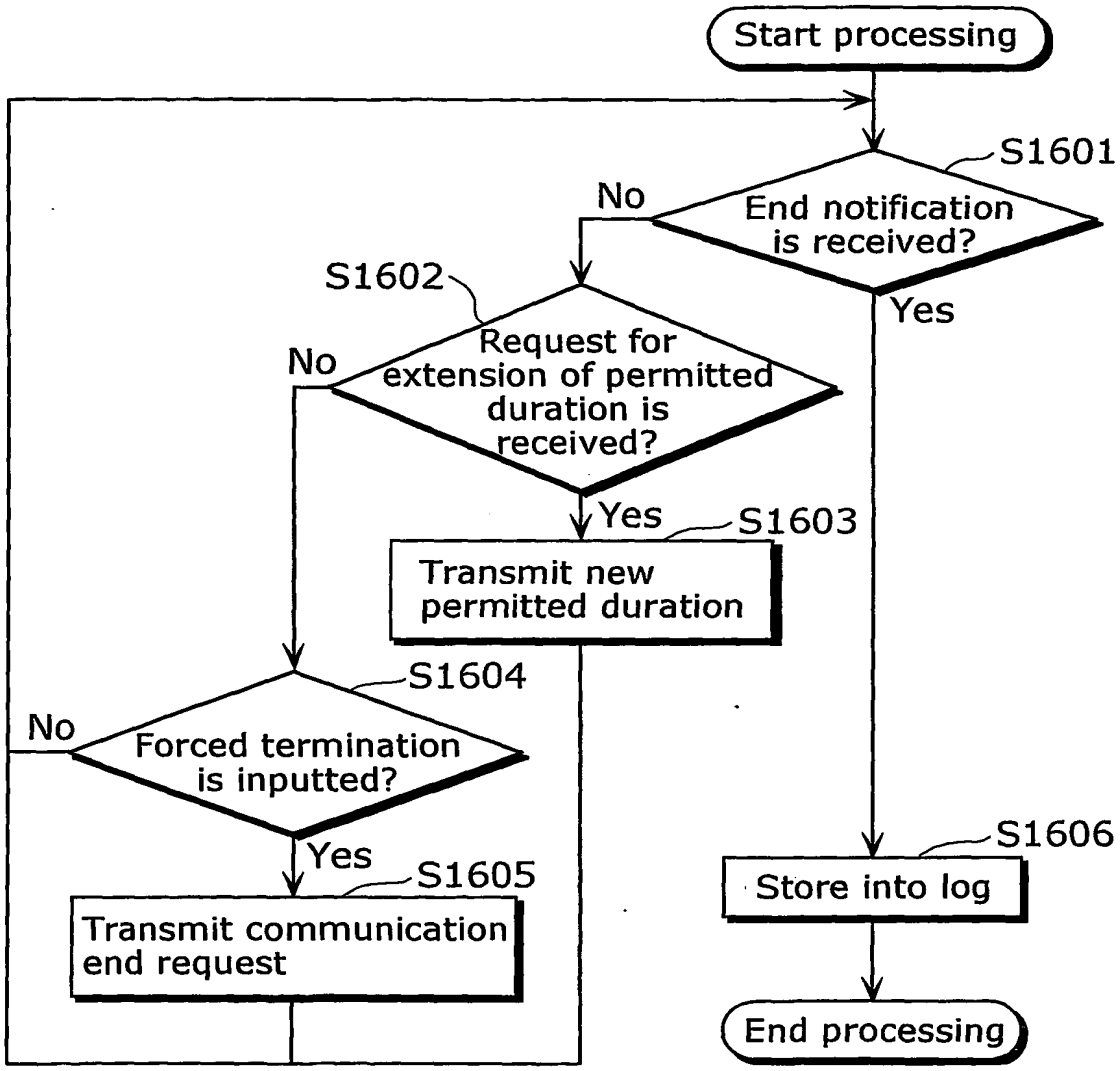
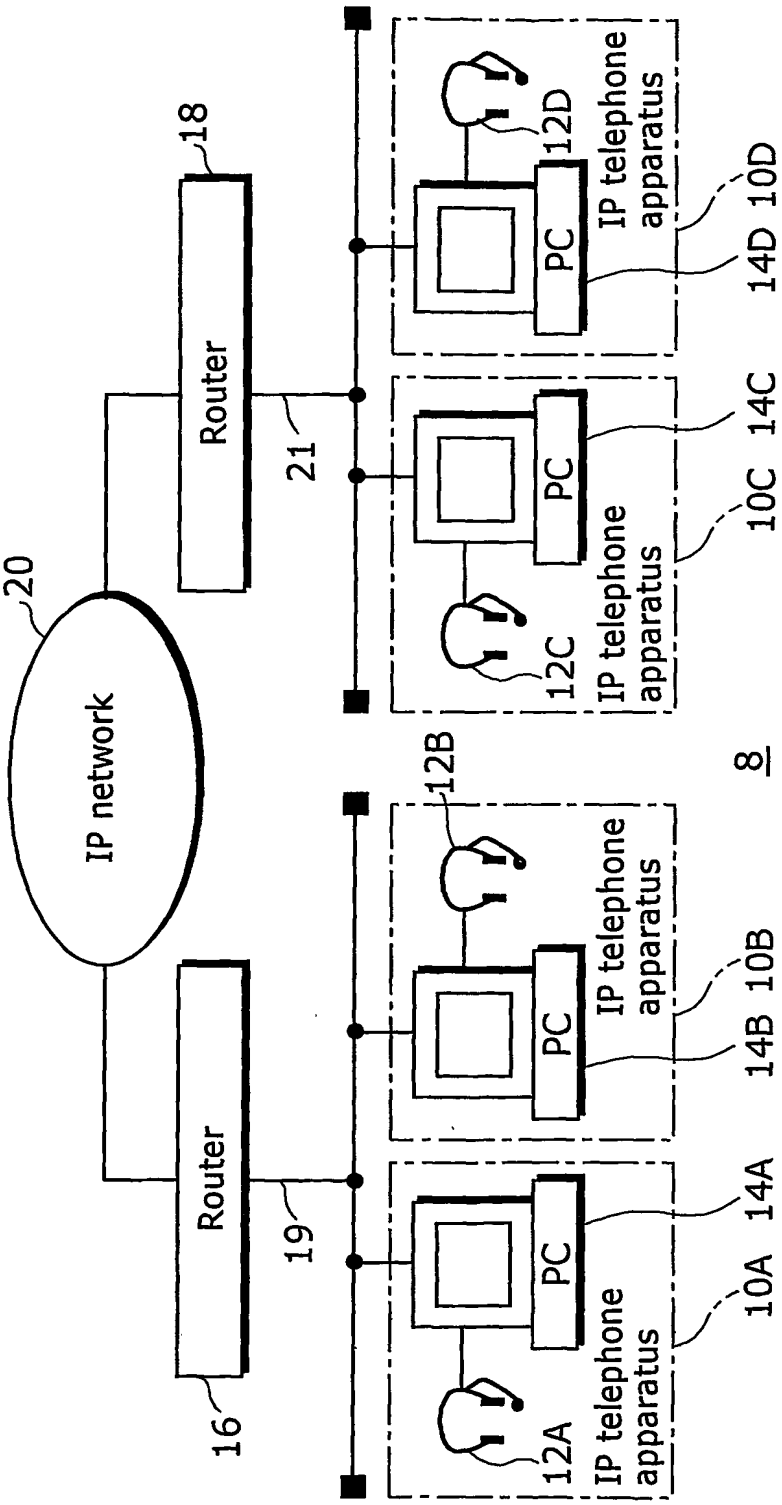

Start processing
S1601
End notification is received?
No
Yes
S1602
Request for extension of permitted duration is received?
No
Yes
S1603
Transmit new permitted duration
S1604
Forced termination is inputted?
No
Yes
S1605
Transmit communication end request
S1606
Store into log
End processing

FIG. 17


IP network
20
Router
18
Router
16
21
19
12A
12B
12C
12D
PC
IP telephone apparatus
14A
14B
14C
14D
10A
10B
10C
10D
8